

Preventing challenging behaviour through the management of instructional antecedents

John J. Wheeler

Tennessee Technological University

Stacy L. Carter

Texas Tech University

Michael R. Mayton

Tennessee Technological University

Morgan Chitiyo

Southern Illinois University, Carbondale

Several methods for evaluating the influence of antecedents on challenging behaviour have been described in the literature, however the portability of these methods within the classroom has been questionable. The purpose of this paper will be to provide a practical understanding of evidence-based practices used in the assessment and management of instructional antecedents. The importance of understanding the relationship between instructional antecedents and desired learner responses will be examined within the context of two adolescent learners with developmental disabilities who experienced challenging behaviour.

The examination of antecedent variables in predicting and minimizing challenging behaviours has received minimal attention in behavioural literature (Smith & Iwata, 1997; Wacker, Berg, Asmus, Harding, & Cooper, 1997) when contrasted with the number of studies that have examined consequence variables and their relationship to challenging behaviours. While the examination of reinforcement contingencies has resulted in the development of effective interventions, the examination of antecedent variables continues to be an important area in need of further research.

Instructional antecedents (e.g., instructional cues) are essential elements in the design and delivery of instruction. Appropriate or accurate responding to an instructional cue by a learner involves both a

discrimination and a reinforcement component (Richman et al. 2001). A learner's inability to respond appropriately or accurately in turn has been referred to as a skill deficit (Gresham, 1981). A skill deficit has been described as task materials and instructions occasioning below expected levels of performance in the absence of prompts (Lerman, Vorndran, Addison, & Kuhn, 2004). A skill deficit can frequently be resolved by directly teaching discrimination skills (Pierce & Schreibman, 1994) or by replacing difficult to discriminate instructional expectations with those that are easier to discriminate (Pierce & Schreibman, 1995; Richman et al., 2001). Yet these aspects of instruction may often be overlooked and result in challenging behaviour and/or a lack of appropriate responding on the part of the learner. Addressing such performance deficits may typically involve conducting functional assessments (Kern, Childs, Dunlap, Clarke, & Falk, 1994), conducting reinforcer assessments (Northrup, George, Jones, Broussard, & Vollmer, 1996), and manipulating schedules of reinforcement (Dixon & Cummings, 2001; Roane, Fisher, & Sgro, 2001).

Several methods for evaluating the influence of antecedents on challenging behaviours have been described within the literature (for a review see Stichter, Conroy, & Boyd, 2004). One method, referred to as lag sequential analysis (Mahon, Shores, & Buske, 1999), has the potential to measure a number of different antecedent events at once but has several limitations such as the need for advanced training to conduct the analysis, the need for computer data collection systems, extended amount of time necessary to complete an evaluation, and difficulty implementing the procedures by teachers (Stichter, Conroy, & Boyd, 2004). Another method for assessing antecedents to challenging behaviour is a functional analysis that examines the functional relationship between challenging behaviour and specific consequences (Repp & Horner, 1998). This method controls for a limited number of antecedents and consequences and can result in interventions that can compete with the reinforcement received from the challenging behaviour. While this method examines the influence of antecedent variables, it does not usually evaluate various forms of antecedent variables directly nor aid in the design of specific interventions that impact on antecedent variables. A third method for evaluating the

influence of antecedent variables has been referred to as structural analysis (Wacker et al., 1997). Structural analysis involves manipulating various antecedent variables and analyzing their influence on challenging behaviours. The advantage of this method is that it includes an initial direct examination of potential interventions associated with reductions in challenging behaviours. The application of structural analysis within classroom settings has been limited in the research literature (Stichter, Sasso, & Jolivette, 2004; Wheeler, Carter, Mayton & Thomas, 2002) largely due to the difficulty of managing the complex logistics of a classroom setting given the technical nature of this approach, and a lack of knowledge and training among teachers with respect to the skills necessary to perform a structural analysis. Thus the application of these methods in classrooms has been questioned.

The purpose of this paper is to describe evidence-based practices in the identification of probable instructional antecedents linked to challenging forms of behaviour in students with developmental disabilities. The paper also describes how data derived from these assessments can assist in not only the management of instructional antecedents but also in improved classroom instruction.

Rationale for Antecedent Management

Understanding the relationship between instructional antecedents and learner behaviour is paramount for teachers as they attempt to promote task engagement and learning. Antecedent management represents a proactive approach for the prevention of challenging behaviour that is also individualized and learner-centered. Aside from preventing problem behaviour it also promotes optimal teaching and learning formats. Once identified, these practices reinforce effective instructional delivery and become incorporated into the regular class routine.

Certainly there are pre-instructional considerations that must be taken into account by teachers prior to initiating instruction. Some points to consider are as follows: (a) Is the learning environment accommodating to learners? (b) Are the instructional cues clear and consistent? (c) Have optimal teaching and response formats specific to the learner(s) been

identified? (d) Are the tasks relevant to the learner i.e., socially valid? (e) Are opportunities for choice provided within the task? These pre-instructional considerations should be evaluated as part of the proposed instructional plan prior to implementation. However, upon implementation of instruction teachers should be keenly aware of instructional antecedents that, when paired with distant setting events, can elicit challenging behavior or lack of engagement on the part of the learner.

Wheeler and Richey (2005) assert that instructional antecedents fall into two major categories. These include task design and task presentation. Task design refers to how tasks are designed including - their functional and developmental relevance to the learner, their length and structure and the availability of choice making opportunities. Task presentation refers to how tasks are instructionally delivered to the student. This includes: the use of instructional cues by the teacher; cues embedded within the task; the use of techniques such as interspersed requesting; the presence of error correction procedures and prompt hierarchies.

Some examples of setting event and antecedents relative to instruction could include task demands, task difficulty, task presentation, teacher affect, lack of instructional cues, and the lack of predictability in the scheduling of tasks.

Using Functional Behavior Assessment to Identify Antecedent/Behaviour Relationships

Although several literature reviews have been conducted on antecedent research, few of these include a discussion of instructional antecedents (Conroy & Stichter, 2003). These reviews have mostly focused on physiological antecedents such as hunger and thirst, or sociological antecedents such as previous social interactions. These types of antecedent variables are important to understanding and addressing problem behaviours, but may be difficult to incorporate into functional behaviour assessments in classroom settings (Burke, Hagan-Burke, & Sugai, 2003). Increasing the portability of functional behaviour assessment procedures from clinical to classroom settings requires

incorporating more instructional antecedents into functional behaviour assessment procedures.

Functional behaviour assessment involves collecting information on variables that precede and follow specific target behaviours. The methods for collecting information may include interviews, checklists, direct observations, and experimental analyses. While the experimental analysis portion of a functional behaviour assessment has and can be used to manipulate specific antecedent variables (Carr & Durand, 1985), the primary focus of most experimental analyses has been on the consequences that reinforce target behaviours. Some examples of functional behaviour assessment procedures that place more emphasis on instructional antecedents have been demonstrated. These examples appear to enhance its application in classroom settings to address problem behaviours that are highly prevalent.

Peyton, Lindauer, and Richman (2005) demonstrated how the assessment of instructional antecedents could be incorporated into a functional assessment conducted in a clinical setting. They manipulated the type of instruction (directive and non-directive prompts) provided during a demand condition of a functional analysis. They found that the type of instruction provided did influence the occurrence of problem behaviour.

An earlier study by Dunlap, Kern-Dunlap, Clarke, & Robbins (1991) demonstrated how functional assessment could be linked directly to instructional antecedents in a classroom setting. Specific components of the school curriculum were manipulated within a functional assessment by means of reversal designs. The problem behaviours of an adolescent female were decreased and on-task behaviours were increased throughout the school day as a result of the intervention.

While incorporating instructional antecedents within a functional behaviour assessment is important in increasing its usefulness in a classroom setting, other complementary procedures have also increased the applicability of functional assessments to instructional antecedents. Curriculum-based assessment (CBA) is one such procedure. It has been

used to identify the instructional levels that are the most appropriate for a particular student (Shapiro, 1990; Shinn, 1998). It also has been used to determine the instructional antecedent manipulations that support reductions in off-task and problematic behaviours (Moore, Anderson, & Kumar, 2005; Roberts, Marshall, Nelson, & Albers, 2001).

Burke, Hagan-Burke, and Sugai (2003) used CBA to develop two different types of instructional approaches within a functional analysis to assess the problem behaviour of a student with a diagnosed learning disability. The CBA procedures allowed the researchers to identify the student's level of reading proficiency and then design instructional approaches (reading with comprehension and reading without comprehension) that were then examined under a no attention condition and an easy access to attention condition. While this study employed the use of CBA to determine the difficulty of a task, it did not specifically test possible interventions during the functional analysis. The instructional intervention (pre-teaching vocabulary) was developed and assessed upon completion of the functional analysis.

Applied Examples of Evidence-Based Practices in the Classroom

The following are case illustrations of evidence-based practices in the use of functional behaviour assessment (FBA) to identify the relationship between instructional antecedents and challenging behaviour for an adolescent with mental retardation and the second one with Autism Spectrum Disorders.

Example 1

Learner Characteristics Richard was an 18-year-old young man with moderate mental retardation and Down syndrome. He frequently engaged in stereotypical behaviour that was operationally defined as "self-cleansing." This behavior was characterized by Richard's repetitive rocking back and forth while licking the palms of his hands and running them through his hair. He was referred for consultation as a result of his lack of engagement during his transition to work program. His schedule

consisted of working half days on a paid work contract assembling mini-blind pulleys.

Instructional Antecedents To ascertain the frequency of occurrence of the target behaviour and to determine its instructional antecedents, a structured interview was conducted with Richard's teacher, and behavioural observations consisting of ABC recording and partial interval recording using a 15-second partial interval scoring procedure carried out. The functional assessment revealed that the function of Richard's behaviour was sensory related, and that the most obvious instructional antecedents related to the behaviour were a lack of teacher proximity and infrequent use of prompts. The data from the FBA indicated that, in this new task in which Richard had no prior learning history, the mean number of prompts per 50-minute instructional period was three.

Intervention Results from the FBA also indicated the need for a systematic instructional plan to assist Richard in the acquisition of relevant job skills needed to perform the task of assembling the pulleys for the mini-blinds. The complex job task of approximately 15 steps required that a task analysis be developed and that Richard be taught the task using a system of most-to-least prompts. Data were collected on the target behaviour "self-cleansing" across baseline. The mean level of self-cleansing behavior was 76% during baseline. The first phase of intervention consisted of a "systematic instruction" which lasted for ten days and reduced the occurrence of the behavior to 55%. During this phase, a whole task method of chaining was used to provide instruction in the assembly task.

It became apparent that other instructional supports were needed by Richard to facilitate the maintenance of his job skills and to redirect his stereotypical behaviour to a more functional, positive alternative. Thus, a third intervention phase was introduced that paired the use of a work basket/finish basket system of structured teaching with self-reinforcement. The teacher would initiate the work period by placing the desired number of mini-blind pulleys in the workbasket. Richard would place each of these in the finish basket on their completion. When all

items were completed, he was provided the opportunity to self-administer the reinforcement of choosing a CD, placing it in his portable CD player and listening to it. In order to ensure that Richard would transition back to work, a portable digital timer was set on 10 minutes. Following his brief reinforcement period he would return to his assembly task. It was interesting to note that his self-cleansing was minimal during this phase with a mean level of occurrence at 17.5%. These data are reflected in Figure 1.

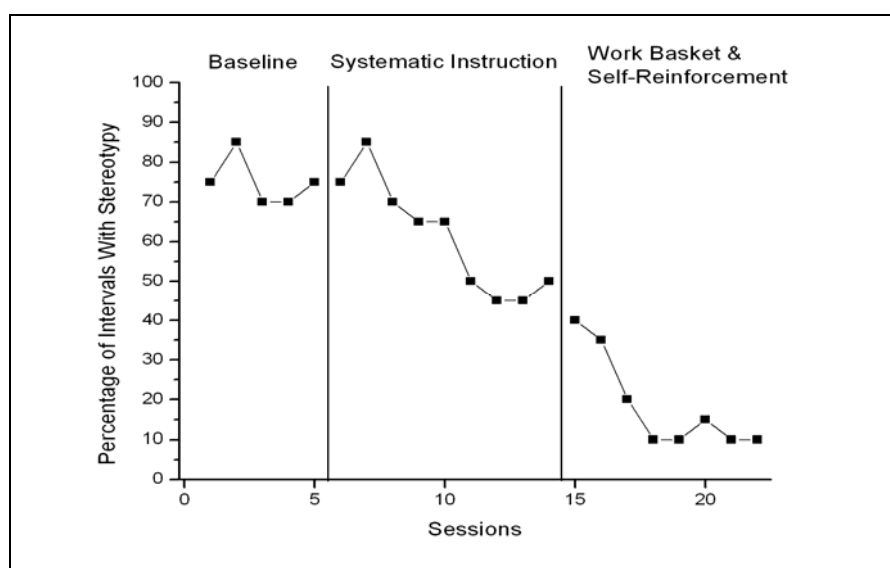


Figure 1.
Percentage of intervals in which stereotypy occurred across systematic instruction and work basket / self-reinforcement conditions (Richard)

Outcomes The positive outcome for Richard was apparent in the reduction of his stereotypy. His rocking continued, but now it was limited to the appropriate context of listening to his music during the self-reinforcement. Richard's example illustrates the importance of predictable instructional cues (antecedents) in facilitating desired responding from the learner. Richard's progress continued. He became increasingly efficient in the performance of his assembly tasks and his increased monetary reinforcement enabled him to purchase additional

CD's for his break time at work as well as for providing him with greater lifestyle freedoms.

Example 2

Learner Characteristics Josh was a 14-year old boy who had been diagnosed with Pervasive Developmental Disorder/Not Otherwise Specified. He was served in a self-contained classroom for learners with moderate to severe disabilities within a middle school. He had significant communication challenges and communicated by using a form of "pigeon sign language." This method was his primary mode of communication at home whereas the school personnel were attempting to teach a functional form of signing exact English.

Instructional Antecedents A functional behaviour assessment revealed that the target behaviours of "task disengagement" were of greatest concern. These consisted of out-of-seat behaviour, self-aggression in the form of "picking at sores and scratching himself until he drew blood" and aggression toward others in the forms of pinching, pushing and hitting. These behaviours would escalate quite rapidly if not caught early in the cycle and redirected. The plausible hypotheses derived from the functional assessment were that the behaviours were related to instruction and served the function of escape and avoidance.

It was observed that the majority of Josh's day was spent in large group instructional formats in which the teacher lecturing made it difficult for Josh's ability to comprehend fully because of his communication difficulties. He performed much better in smaller instructional settings where instruction was delivered to no more than three students. This was seen in a videotape of Josh receiving instruction across a three day period.

The tape was analyzed by two team members independently using a 15-second partial interval recording procedure designed to note the occurrence/non-occurrence of the target behaviors and of relevant antecedent stimuli. Inter-rater reliability was calculated on the entire analysis using an occurrence /occurrence + non-occurrence formula, and

was found to be a mean of 94% across all sessions. Figure 2 illustrates the rate of target behaviours during group instruction was a mean of 76.6% across three days whereas his rate of behaviour was vastly less during individualized instructional groupings with occurrences averaging 23% across the three days of videotaping.

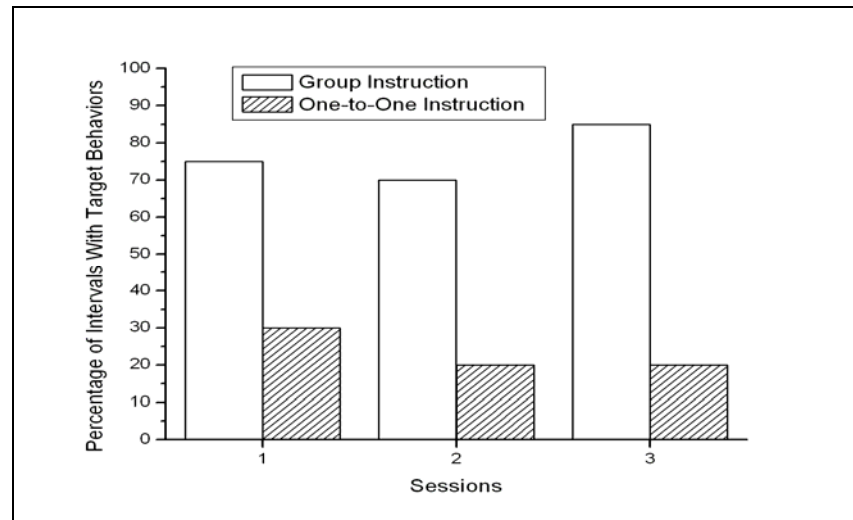


Figure 2.
Percentage of intervals in which target behaviours occurred across sessions (Josh)

Intervention Further analysis of the videotape indicated that during individualized or smaller instructional groupings more gestural cues were used by the teaching assistants, and instructional materials relied more on embedded cues within the instructional context than was the case in larger instructional groupings. The recommendations were provided: use more functional age-appropriate instructional materials; lessen the degree of group instruction and use a consistent form of instructional presentation that relied on embedded cues within tasks when possible; use error correction procedures; provide choice making opportunities during instruction; and provide opportunities for functional and preferred reinforcers upon task completion.

Summary

The examples of methods for manipulating instructional antecedents are intended to demonstrate ways to increase the portability of these procedures into classroom settings. The example of Josh demonstrated how pairing the appropriate instructional setting (group vs. one-to-one instruction) resulted in decreased problem behaviour. Teachers may arbitrarily increase the variation in their classrooms by incorporating group and one-to-one instruction within their classrooms. This may be an appropriate and effective instructional approach for some students. However, for some students these instructional approaches need to be appropriately matched to the student based on an assessment of how instructional antecedents may influence their behaviour. For Richard, the introduction of increased variation would not have necessarily decreased his problematic behavior, rather a more systematic method of instruction was necessary. This example demonstrates how the assessment of the influence of instructional variables can lead to instructional modifications that may be necessary to effectively reduce problem behaviour.

While each of the examples are indicative of good teaching strategies, they both include an examination of instructional antecedents that lead to the development of interventions. The inclusion of a thorough assessment of variables influencing problem behaviour may enhance the potential effectiveness of interventions attempted in the classroom. In addition, an assessment of instructional antecedents may result in procedures that produce intended results quicker by avoiding the implementation of capricious interventions that are not based on a thorough assessment of instructional antecedents and may require time to determine their lack of effectiveness.

Conclusions

Antecedent events can be of critical importance in designing instructional goals and objectives and instructional methods to be used by the teacher. Different methods for evaluating the influence of antecedents on challenging behaviours have been discussed. These

methods which include lag sequential analysis, functional analysis and structural analysis, help prevent challenging behavior and promote learning by facilitating essential prerequisite skills to learning such as task engagement.

This paper demonstrated the utility of antecedent management in reducing challenging behaviour and improving instruction. Practical evidence of the effectiveness of these proactive strategies has also been presented. Incorporating these strategies into functional behaviour assessments in classroom settings can yield tremendous results for teachers in addressing challenging behavior in their classrooms. However, concern has been raised about the portability of these strategies from clinical to applied settings. The present paper was intended to provide functional examples of the efficacy and importance of using functional behaviour assessment to assess the role of instructional antecedents and challenging behaviour. Future research should, therefore, address portability issues and application of these strategies in different classroom settings.

References

- Burke, M. D., Hagan-Burke, S., & Sugai, G. (2003). The efficacy of function-based interventions for students with learning disabilities who exhibit escape-maintained problem behaviours: Preliminary results from a single-case experiment. *Learning Disability Quarterly*, 26, 15-25.
- Carr, E.G., & Durand, V.M. (1985). The social communicative basis of severe behaviour problems in children. In S. Reiss & R.R. Bootzin (Eds.), *Theoretical issues in behaviour therapy* (pp. 219-254). New York: Academic Press.
- Conroy, M. A., & Stichter, J. P. (2003). The application of antecedents in the functional assessment process. *Journal of Special Education*, 37, 15-25.
- Dixon, M. R., & Cummings, A. (2001). Self-control in children with autism: Response allocation during delays to reinforcement. *Journal of Applied Behaviour Analysis*, 34, 491-495.

- Dunlap, G., Kern-Dunlap, Clarke, & Robbins, S. (1991). Functional assessment, curricular revision and severe behaviour problems. *Journal of Applied Behaviour Analysis*, 24, 387-397.
- Gresham, F. M. (1981). Assessment of children's social skills. *Journal of School Psychology*, 19, 120-134.
- Kern, L., Childs, K. E., Dunlap, G., Clarke, S., & Falk, G. D. (1994). Using assessment-based curricular intervention to improve the classroom behaviour of a student with emotional and behavioural challenges. *Journal of Applied Behaviour Analysis*, 27, 7-19.
- Lerman, D. C., Vorndran, C., Addison, L., & Kuhn, S. A. C. (2004). A rapid assessment of skills in young children with autism. *Journal of Applied Behaviour Analysis*, 37, 11-26.
- Mahon, K., Shores, R. E., & Buske, C. J. (1999). Issues of conducting research on setting events: Measurement and control of dependent and independent variables. *Education and Treatment of Children*, 22, 317-332.
- Moore, D. W., Anderson, A., & Kumar, K. (2005). Instructional adaptation in the management of escape-maintained behaviour in a classroom. *Journal of Positive Behaviour Interventions*, 7, 216-223.
- Northrup, J., George, T., Jones, K., Broussard, C., & Vollmer, T. R. (1996). A comparison of reinforcer assessment methods: The utility of verbal and pictorial choice procedures. *Journal of Applied Behaviour Analysis*, 29, 201-212.
- Peyton, R. T., Lindauer, S. E., & Richman, D. M. (2005). The effects of directive and nondirective prompts on noncompliant vocal behaviour exhibited by a child with autism. *Journal of Applied Behaviour Analysis*, 38, 251-255.
- Pierce, K. L., & Schreibman, L. (1994). Teaching daily living skills to children with autism in unsupervised settings through pictorial self-management. *Journal of Applied Behaviour Analysis*, 27, 471-481.
- Pierce, K. L., & Schreibman, L. (1995). Increasing complex social behaviours in children with autism: Effects of peer implemented pivotal response training. *Journal of Applied Behaviour Analysis*, 28, 285-295.
- Repp, A., & Horner, R.H. (1998). *Functional analysis of problem behaviour: From effective assessment to effective support*. Belmont, CA: Wadsworth.

- Richman, D. M., Wacker, D. P., Cooper-Brown, L. J., Kayser, K., Crosland, K., Stephens, T. J., & Asmus, J. (2001). Stimulus characteristics within directives: Effects on accuracy of task completion. *Journal of Applied Behaviour Analysis*, 34, 289-312.
- Roane, H. S., Fisher, W. W., & Sgro, G. M. (2001). Effects of a fixed-time schedule on aberrant and adaptive behavior. *Journal of Applied Behaviour Analysis*, 34, 333-336.
- Roberts, L. M., Marshall, J., Nelson, R., & Albers, C. A. (2001). Curriculum-based assessment procedures embedded within functional behavioural assessments: Identifying escape-motivated behaviours in a general education classroom. *School Psychology Review*, 30, 264-272.
- Shapiro, E. S. (1990). An integrated model for curriculum-based assessment. *School Psychology Review*, 19, 331-350.
- Shinn, M. (Ed.). (1998). *Advanced applications of curriculum-based measurements*. New York: Guilford Press.
- Smith, R. G., & Iwata, B.A. (1997). Antecedent influences on behaviour disorders. *Journal of Applied Behavior Analysis*, 30, 343-375.
- Stichter, J. P., Conroy, M. A., & Boyd, B. A. (2004). The undefined role of the antecedent: Addressing the measurement quagmires in applied research. *Education and Treatment of Children*, 27, 490-508.
- Stichter, J.P., Sasso, G.M., & Jolivette, K. (2004). Structural analysis and intervention in a school setting: Effects on problem behaviour for a student with an emotional/behavioural disorder. *Journal of Positive Behavior Interventions*, 6, 166-177.
- Wacker, D. P., Berg, W. K., Asmus, J., Harding, J., & Cooper, L. J. (1997). Experimental analysis of antecedent influences on challenging behaviours. In J. Luiselli & M. Cameron (Eds.), *Antecedent control: Innovative approaches to behavioral support* (pp. 67-86). Baltimore: Brookes.
- Wheeler, J.J., Carter, S.L., Mayton, M.R., & Thomas, R.A. (2002). Structural analysis of instructional variables and their effects on task engagement and self-aggression. *Education and Training in Mental Retardation and Developmental Disabilities*, 37, 391-398.
- Wheeler, J.J., & Richey, D.D. (2005). *Behaviour management: Principles and practices of positive behaviour supports*. Upper Saddle River: Pearson/Merrill/Prentice Hall.